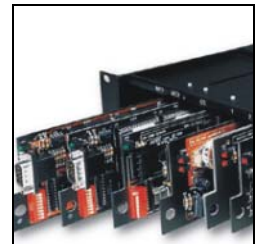




instruction manual

AXB-EM232

Enhanced Master RS-232 Controller



Access Central Controllers

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Product Information

Product Information

The AXB-EM232 Enhanced Master RS-232 Controller (FIG. 1) is an AXlink bus device that functions like an AMX Master Card in a single compact enclosure. It is fully compatible with the Access Control System and can be used either as a stand-alone device or with other AMX bus devices. The AXB-EM232 runs complete Access programs, and controls other AXlink components and two devices using RS-232 as a control protocol. It can also control devices using RS-422 and RS-485 protocols.

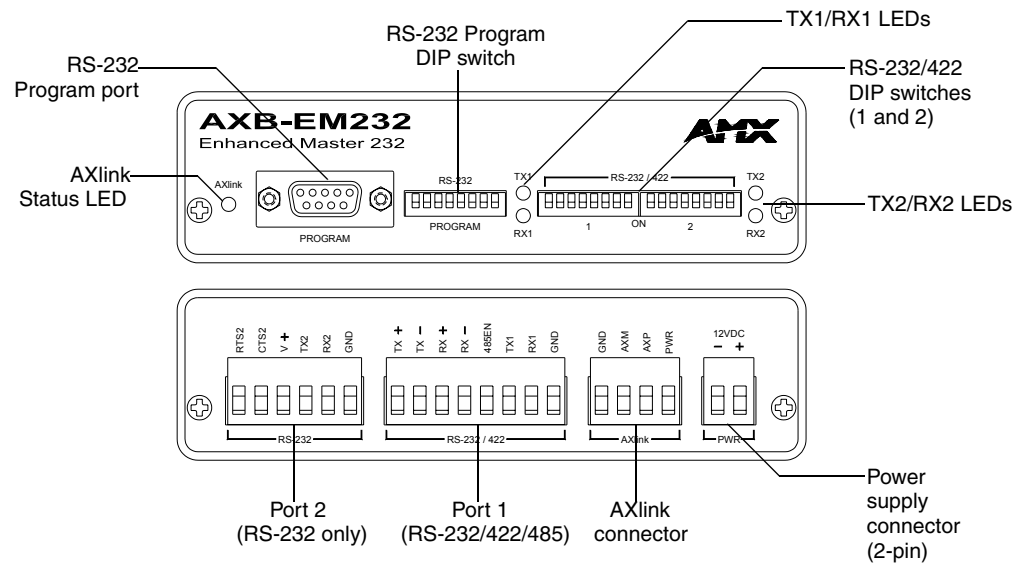


FIG. 1 AXB-EM232 Front and rear panel components

Specifications

The following table lists the specifications for the AXB-EM232.

AXB-EM232 Product Specifications	
Power	12 VDC, 160 mA
Asynchronous data communication	<ul style="list-style-type: none"> • Baud rates: 300, 600, 1200, 2400, 4800, 9600, 19200, or 38400 • Data bits: 7 or 8 • Stop bits: 1 or 2 • Parity: None, Odd, Even, Mark, or Space
Memory	64 KB battery protected memory, expandable to 256 KB
Front Panel Components:	
AXlink status LED	<p>Green LED lights to indicate AXlink communication as status as follows:</p> <ul style="list-style-type: none"> • One blink per second : Power is active and AXlink communication is functioning. • Two blinks per second: Devices specified in the master program do not match the specified devices found. • Three blinks per second: Indicates an AXlink communication error. • Full-on indicates the following conditions: <ul style="list-style-type: none"> There is no AXlink control or activity, but power is on. The Access program is not loaded.
RS-232 Program connector	This DB-9 RS-232 connector is used for AMX programming tools, such as Access and IRLIB.
RS-232 Program DIP switch	The 8-position DIP switch configures the communication parameters for the Program port.
TX1 and RX1 LEDs	The red LEDs indicate that the AXB-EM232 is receiving (RX) or transmitting (TX) RS-232, RS-422, or RS-485 data. RX1 and TX1 correspond to Port 1 on the rear panel (See <i>Rear Panel Components</i> for a description of Port 1).
RS-232/422 1 and 2 DIP Switches	The two 8-position DIP switches configure the communication parameters for the Ports 1 and 2 (See <i>Rear Panel Components</i> for a description of Ports 1 and 2).
TX2 and RX2 LEDs	The red LEDs indicate that the AXB-EM232 is receiving (RX) or transmitting (TX) RS-232 data. RX2 and TX2 correspond to Port 2 (See <i>Rear Panel Components</i> for a description of Port 2).
Rear Panel Components:	
Ports 1 and 2	There are two serial connectors: Port 2 is a 6-wire RS-232 captive-wire connector; Port 1 is an 8-wire RS-232/422 captive wire connector.
AXlink connector	The AXlink connector is a 4-wire, captive-wire connector for data and power.
Power supply connector	The PWR connector is a 2-wire, captive-wire connector for the 12 VDC power supply.
Enclosure	Non-glare, high-impact black plastic
Dimensions (HWD)	1.5" x 5.6" x 6.5" (3.8 cm x 14.1 cm x 16.4 cm)
Weight	1.1 lbs (501.7 g)
Mounting options	Rack mounting with the optional AC-RK Accessory Rack Kit
Optional Accessories:	
Power Supply	<ul style="list-style-type: none"> • PSN2.8 (FG423-05) • PSN6.5 Domestic (FG423-41), International (FG423-43)
Mounting Hardware	AC-RK Accessory Rack Kit (FG515)

Installation

Setting the internal jumpers

Some RS-232 devices require that the bus be terminated at 100 ohms. Follow these steps if your device requires this termination.

1. Discharge the static electricity from your body.
2. Unplug the two-pin power connector.
3. Remove the two screws on the front panel.
4. Remove the front panel, and slide the circuit board out of the enclosure.
5. Remove the jumper on pin trio E1 from pins 2-3 and place it on pins 1-2 (FIG. 2).

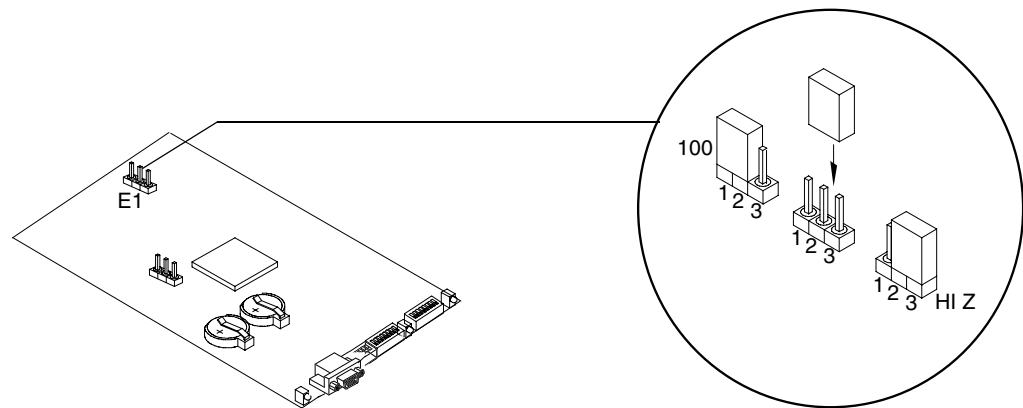


FIG. 2 Communication jumpers

6. Replace the board in the enclosure. Then, replace the front panel, refasten the two screws, and plug in the two-wire power connector.

Setting DIP switches

Configure the device and programming communication ports' baud rate, data bits, stop bits, and parity. Use the eight-position DIP switches on the front panel to set the communications parameters.

- **RS-232 PROGRAM DIP switch** - Use the eight-position RS-232 Program DIP switch to set the communications parameters for the PROGRAM port.
- **RS-232/422 DIP switches** - Use the two eight-position RS232/422 DIP switches to set communications parameters for controlling the RS-232, RS-422, or RS-485 devices.
 - Set Switch 1 to configure the parameters for Port 1 (RS-232/422/485).
 - Set Switch 2 to configure the parameters for Port 2 (RS-232 only).

Refer to the following table when setting the DIP switches.

Communication Parameters DIP Switch Settings								
Switch Function	1	2	3	4	5	6	7	8
Setting Value	Off 2 bits	Off 7 bits	Off	Off Unused	Off	Off	Off 300	Off
	On 1 bit	On 8 bits	On	Off Unused	Off	On	Off 600	Off
			Off Unused	On	Off	Off	On 1,200	Off
			On Unused	On	Off	On	On 2,400	Off
			Off Mark	Off	On	Off	Off 4,800	On
			On Even	Off	On	On	Off 9,600	On
			Off Odd	On	On	Off	On 19,200	On
			On None	On	On	On	On 38,400	On

RS232/422

Wiring Devices to the AXB-EM232

The AXB-EM232 has captive-wire connectors on the rear panel (FIG. 1) for AXlink, RS-232, RS-232, RS-422, and 12 VDC power.

Preparing captive wires

- Strip 0.25 inch of wire insulation off all wires.
- Insert each wire into the appropriate opening on the connector according to the wiring diagrams and connector types described in this section.

Do not tighten the screws excessively; doing so may strip the threads and damage the connector.

Using AXlink

Connect the AXlink wiring to the connector on the AXB-EM232, as shown in FIG. 3.

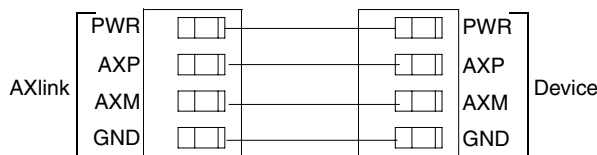


FIG. 3 AXlink wiring

Using Ports 1 and 2 for RS-232 data communication

1. Connect the RS-232 wiring to Port 1, as shown in FIG. 4.

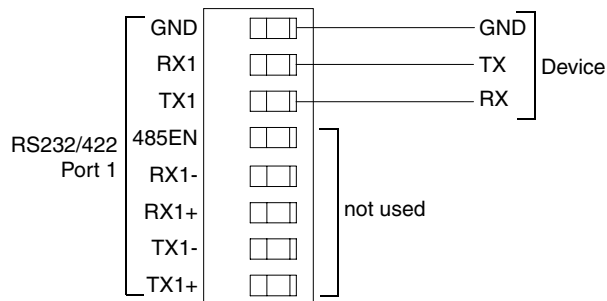


FIG. 4 RS-232 Port 1 wiring

2. Connect the RS-232 wiring to Port 2, as shown in FIG. 5.

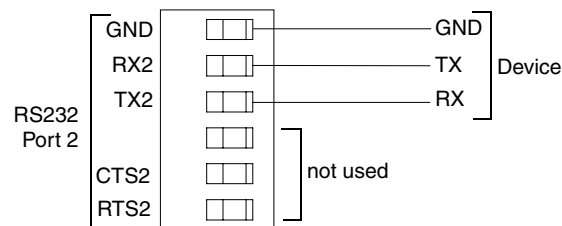


FIG. 5 RS-232 Port 2 wiring

3. Configure the AXB-EM232 for hardware handshaking (request to send, clear to send) by connecting the RS-232 wiring to Port 2, as shown in FIG. 6.

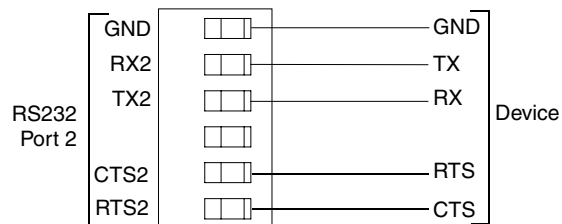


FIG. 6 RS-232 Port 2 wiring for hardware handshaking

Using Port 1 for RS-422 communication

Wire the AXB-EM232 for communicating via RS-422 by connecting the RS-422 wiring to Port 1, as shown in FIG. 7. RS-422 communication is available only through Port 1.

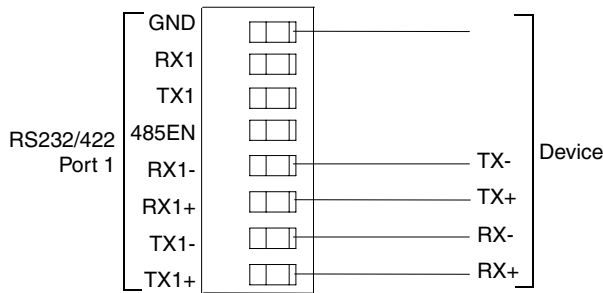


FIG. 7 RS-422 Port 1 wiring

Using Port 1 for RS-485 data communication

To wire the AXB-EM232 for communicating via RS-485, connect the RS-485 wiring to Port 1, as shown in FIG. 8. RS-485 communication is available only through Port 1. You must ground the 485EN pin.

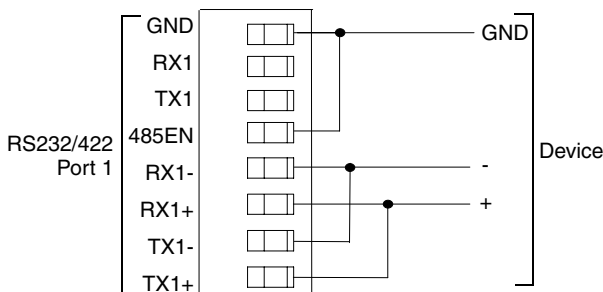


FIG. 8 RS-485 Port 1 wiring

Using the 12 VDC power supply

Connect the optional 12 VDC power supply to the two-wire power connector to apply power, as shown in FIG. 9.

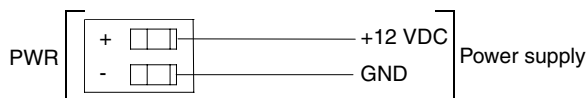
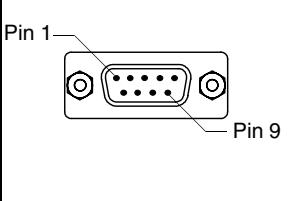


FIG. 9 12 VDC Power connector wiring

RS-232 male program connector

Use either an AMX RS-232 cable (FG 10-726) for a DB-25 connector or AMX Programming cable (FG10-727) for a DB-9 port to connect your PC to the AXB-EM232 and download the Access program. *Do not use a null modem cable.*

Program Connector and Pinouts		
	Pin	Signal
	2	RXD
	3	TXD
	4	+12 VDC
	5	GND
	7	+12 VDC



Only an AMX Programming cable or equivalent is to be used due to the voltage on pins 4 and 7. Failure to do so could damage the com port on a PC.

Replacing the Lithium Batteries

The AXB-EM232's two lithium batteries each have a life of approximately 5 years to protect its memory. When DC power is on, the batteries are not used. When you install the AXB-EM232, record for future reference the date the batteries should be replaced. When you replace the batteries (FIG. 10), remove one battery at a time to avoid losing the program in memory.



All data in the AXB-EM232 memory will be lost if you are not timely in replacing the batteries.

Before removing the batteries, contact your AMX dealer and verify that they have a current copy of your program. This will avoid any inadvertent loss of data and prevent an unnecessary service outage..

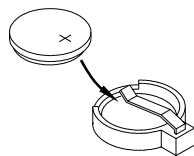


FIG. 10 Lithium battery and socket



There is a danger of explosion if you replace the bat-teries incorrectly. Replace batteries with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions. Never recharge, dis-assemble, or heat the battery above 212°F (100°C). Never solder directly to the battery or expose the contents of the battery to water.

1. Discharge the static electricity from your body.
2. Unplug the 2-pin power connector and any other connectors.
3. Remove the two screws on the front panel.
4. Remove the front panel, and slide the circuit board out of the enclosure.

5. Carefully slide one battery out of its socket, and insert the new battery.
6. Plug the 2-pin power connector in to reapply power. Wait one minute; then, remove the power connector again.
7. Carefully slide the other battery out of its socket, and insert the new battery.
8. Plug in the 2-pin power connector.
9. Slide the circuit board back into the enclosure.
10. Replace the front panel and refasten the two screws.
11. Reconnect any connectors you removed.

Mounting the AXB-232 In an Equipment Rack

To rack-mount the AXB-EM232 using an (optional) AC-RK Accessory Rack Kit:

1. Remove any/all connectors from the rear panel.
2. Remove the two screws on the front panel, and remove the front panel and the space bracket behind the panel.
3. Use a blade or other sharp object to remove the rubber feet on the bottom of the AXB-EM232 enclosure.
4. Place the unit in the appropriate opening in the AC-RK.
5. Place the front panel of the AXB-EM232 on the front of the rack over the unit, and secure.

Programming

Use the NetLinX Studio software program to create and edit an Access Control program for the AXB-EM232:

- The AXB-EM232 occupies address 0.
- Port 1 is AXlink Device 1, and Port 2 is AXlink Device 2.
- To communicate directly with the AXB-EM232, use Terminal Emulation mode.
- To display a list of the commands in the Terminal Emulation mode, type help or ? and press ENTER.
- For online help while in Access, press F6.



NOTE

Program the AXB-EM232 as you would the AXC-EM Enhanced Master Card.

Send_Commands

The following table lists the Send_Commands for the AXB-EM232.

Send_Commands	
'RXON'	Enables the card to send incoming received characters to the Master. This command is automatically sent by the Master when a 'CREATE_BUFFER' command is executed.
'RXOFF'	The card will not pass on received characters to the Master (default).
'RXCLR'	Any characters in the receive buffer waiting to be sent to Master will be cleared.
'TXCLR'	Any characters waiting in the transmit out buffer will be cleared and transmission will stop.
'B9MON'	Enables a special 9 data bits with 1 stop bit mode, which overrides the DIP switch settings for number of data, stop, and parity bits. The baud rate is locked on at the current DIP switch setting on issuance of this command.
'B9MOFF'	Sets data bits mode to normal with DIP switch setting (default).
'HSOFF'	Disables hardware handshaking (default). (Device 2 only)
'HSON'	Enables hardware handshaking. (Device 2 only)
'XOFF'	Disables software handshaking (default).
'XON'	Enables hardware handshaking.
'CHARD <time in 100 microsecond increments 0-255>'	Sets delay between all transmitted characters to that specified. Example: ' CHARD-10 ' Sets 1 ms delay between all transmitted characters.
'CHARDM <time in millisecond increments 0-255>'	Sets delay between all transmitted characters to that specified. Example: ' CHARDM10 ' Sets 10 ms delay between all transmitted characters.
'CTSPSH'	Enables PUSHes and RELEASEs and status on Device 2 channel 255 for CTS hardware handshake input. If CTS is high, then channel is on.

Send_Strings

This device also has some special Send_String escape sequences. If any of the three-character combinations in the following table are found anywhere within a Send_String program instruction, they will be treated as a command and not the literal characters.

Send_String sequences	
"27,17,<time in 100 microsecond increments 1-255>"	Sends a break character of the specified length of time.
"27,18,1"	Sets the 9 data bit to 1 for all subsequent characters to be transmitted. Used with the 'B9MON' command.
"27,18,0"	Clears the 9 data bit to 0 for all subsequent characters to be transmitted. Used with the 'B9MON' command.
"27,19,<time in 1 millisecond increments 1-255>"	Inserts a delay before the next character to be transmitted.
"27,20,0"	Unasserts RTS hardware handshake output high (Device 2).
"27,20,1"	Asserts RTS hardware handshake output low (Device 2).

Xmodem timing commands

The following table lists the AXB-EM232 Xmodem timing commands. Xmodem timeouts and retries exist to accommodate potential Ethernet delays and for consistency among and within products.

Xmodem timing commands	
'TIMEOUT XX'	Xmodem timeouts - via the Program Port (default = 10 sec.)
SEND_COMMAND SERIAL, 'XMTO XX'	Over AXlink; where XX is from one to 50 seconds in 1-second increments.
'RETRY XX'	Xmodem retries - via the Program Port (default = 5).
SEND_COMMAND SERIAL, 'XMRT XX'	Over AXlink; where XX is from one to 10 in increments of one.

Any of the above will change timing for Access code download as well as firmware upgrades.



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